

**SHOSHONE RIVER AREA WILDLAND URBAN
INTERFACE RISK ASSESSMENT AND
MITIGATION PLAN**

MITIGATION PLAN

EXECUTIVE SUMMARY

Greystone Environmental Consultants, Inc. and Anchor Point Group (the Greystone Anchor Point team) conducted an assessment of the wildland fire hazard and risk in four priority areas. These areas were divided further into 18 communities for hazard analysis. Of the 18 communities in the project area, none were found to represent an extreme or very high hazard; seven were identified as having a high hazard, eight as moderate hazard, and three as low hazard.

There are no landscape-level recommendations for fuel breaks or prescribed fire in the project area. Continued use of prescribed fire on public lands will benefit the ecosystem and return vegetation to more healthy and historic conditions. Neither prescribed fire or fuel breaks at a landscape-scale will provide significant protection to private property and infrastructure in the wildland-urban interface. Instead, defensible space is recommended for private property owners in the project area.

This report recommends mitigation by community, as ranked in the community assessment in Part I. This plan identifies defensible space as the most important mitigation recommendation. An aggressive program to implement defensible space for every home, prioritized by community hazard rating, is recommended. Once all interested landowners have created defensible space, mitigating access routes by prioritized community is also recommended. Further mitigation recommendations by community, such as providing cisterns, are provided with each community summary.

Several general recommendations are also discussed for addressing residences, emergency response planning, fire department preparedness, community education, and insect surveys.

This mitigation plan also includes a discussion of the roles and responsibilities of the agencies involved. It concludes with a brief discussion of funding resources.

1.0 BACKGROUND

This section briefly summarizes the existing situation and organization structure that are described more fully in the community assessment.

1.1 EXISTING SITUATION

The Shoshone River project area is addressed in this mitigation plan. The project area is located along the North and South Forks of the Shoshone River extending from the Shoshone National Forest boundary on the west to Cody, Wyoming in the east. Four priority areas made up of primarily private land were identified for assessment by the Bureau of Land Management (BLM) and the Park County Fire Protection District (PCFPD) #2 (see **Figures 2-1** and **2-2** of the Community Assessment).

Greystone Environmental Consultants, Inc. and Anchor Point Group (the Greystone Anchor Point team) conducted an assessment of the wildland fire hazard and risk in the priority areas. These areas were divided further into 18 communities for hazard analysis. Of the 18 communities in the project area, none were found to represent an extreme or very high hazard; seven were identified as having a high hazard, eight as moderate hazard, and three as low hazard.

The Greystone Anchor Point team also conducted assessments of 188 parcels in the project area, 2004. A 1-page description was prepared for every parcel. These are provided to BLM and the PCFPD #2 under separate cover to protect the privacy of the landowners.

The Greystone Anchor Point team also summarized an extensive list of values to be protected in the project area. Five were identified priorities for protection in the project area. Protection of life and fire fighter safety are always the highest priority in fire mitigation and suppression. Other prioritized values include: watershed, tourism, private property and infrastructure, and recreation.

The majority of the project area is considered at a high risk for WUI fires. From 1992 to 2003, the Absaroka Front fire management unit had 41 fires affecting more than 17,000 acres. Approximately 80 percent of the fires were ignited by lightning and 20 percent were human-caused. The PCFPD #2 reports responding to an estimated 35 to 50 wildland fire calls per year in the project area.

The probability of increased fire ignitions and severe fire behavior is influenced by several local factors in the Shoshone project area. These factors include the topography, significant insect-related tree mortality adjacent to the project area, heavy fuel loads in the drainages, and a drought currently affecting the region.

1.2 ORGANIZATIONAL STRUCTURE

This report has been overseen by the BLM and PCFPD #2. The Greystone Anchor Point team has worked with these two agencies to facilitate the involvement of other agencies and the public. Project implementation has included communication with the Park County Commissioners, the Shoshone National Forest, and the Wyoming State Forester. Two public meetings will be held to involve and educate the public. The BLM and PCFPD have joint responsibility for implementing any recommendations in this mitigation plan.

2.0 GOALS AND OBJECTIVES

Based on congressional direction, the BLM seeks to reduce the hazard of wildland fire through the Communities at Risk Program. The purpose of the program is to reduce the risk of wildland fire in WUI communities through education, prevention, hazardous fuels reduction, and increasing fire protection capabilities. The Shoshone River area assessment and mitigation plan has been conducted as part of this program. This section identifies the goals and objectives for the mitigation plan. There are three goals for this project:

1. Enhance life safety for residents and responders.
2. Mitigate (limit) wildland fire damage to property and infrastructure.
3. Mitigate wildland fire damage to the environment, quality of life, and other values to be protected.

In order to accomplish these goals, the following objectives have been identified:

1. Establish an approximate level of risk (the probability of an ignition occurrence) for the project area.
2. Provide a scientific analysis of the fire behavior potential of the project area
3. Group values-at-risk into "communities" that represent relatively homogenous hazard factors
4. Identify and quantify factors that mitigate the wildland fire hazard to the communities and their values to be protected
5. Recommend specific actions that will reduce hazards to the values-at-risk

3.0 STRATEGIC PLAN / DESIRED CONDITION

The desired condition of the project area is to use fuel treatments to reduce the threat of significant impacts from wildland fire in the project area. Treatments should reduce both the dangers associated with fire suppression for fire fighters and the risk to the general public.

The composition of forest and rangeland should more closely mimic their natural range of variability. These ecosystems will then be more likely to function in a healthy manner and be more tolerant to fire. Desired conditions for plant communities are described in detail in BLM's draft Fire Management Plan (BLM 2004).

As part of the desired future conditions, vegetation treatments should be designed to ensure the overall ecological health of treated areas. Noxious weeds and invasive species should be managed to prevent their introduction or spread. Riparian communities will be managed to protect the area's hydrology.

The most important aspect of the desired future condition in the project area is homeowner education and awareness. Creating defensible space around private property is the first priority in this mitigation plan.

4.0 TACTICAL PLAN

This section presents the tactical plan for addressing wildland fire hazard in the project area. Landscape level, community, and general recommendations are discussed below.

4.1 LANDSCAPE-LEVEL RECOMMENDATIONS

There are no landscape-level recommendations for fuel breaks or prescribed fire in the project area. Continued use of prescribed fire on public lands will benefit the ecosystem and return vegetation to more healthy and fire-adapted conditions. Neither prescribed fire or fuel breaks at a landscape-scale will provide significant protection to private property and infrastructure in the wildland-urban interface. Instead, defensible space is recommended for private property owners in the project area.

Conifer stands occur primarily in stringers and patches rather than as continuous canopy throughout the project area. These stands are highly susceptible to wildland fire due to their density and high mortality from beetle infestation. For more properties, if continuous fuel loads exist near residences, they are predominantly sage and short grasses. Some individual properties bordering the Shoshone National Forest would benefit from a shaded fuelbreak. However, creating defensible space around each building would be far more effective in reducing the overall threat of wildland fire to the majority of homes in the project area.

Given the fuel types present in the project area, landscape-scale fuel breaks are not likely to increase life safety or property conservation. Community- and parcel-level recommendations are therefore emphasized for the project area.

4.2 COMMUNITY-LEVEL RECOMMENDATIONS

The Greystone Anchor Point team recommends addressing mitigation by community in the order listed in **Table 4-1**. The community assessment identified seven of the 18 communities in the project area at high hazard. Construction type, condition, age, fuel loading of the structure and its contents, and location are all contributing factors in making homes more susceptible to ignition under even moderate burning conditions. Under extreme burning conditions, rapid fire growth and spread is possible in these areas due to steep topography and fast burning, flashy fuels. Some of these areas may also have poor access routes and long response times.

The most important goal for the improvement of life safety and property preservation is for every home in the project area to have conforming defensible space.

This is especially important for residences in high hazard communities that have flammable wood roofs. An aggressive program to implement defensible space for homes will do more to limit fire-related property damage than any other single recommendation in this report.

The Greystone Anchor Point team therefore recommends that BLM and PCFPD #2 work with property owners to implement defensible space on private property starting with the first priority community and proceeding as time and funds allow. Once all interested landowners have created defensible space, access routes may then be addressed, then the other recommended mitigation measure should be implemented for the community. These are provided at the bottom of each

community summary, under **Comments & Mitigation Notes**. General guidelines of other recommendations are provided in Section 4.3.

TABLE 4-1 COMMUNITY MITIGATION PRIORITIES		
Community	Hazard Level	Priority
Logan Mountain	High	1
Lower Wapiti Heights	High	2
Golden Walls	High	3
Green Creek	High	4
Old Johansson Ranches	High	5
Canyon Creek	High	6
Whit Creek	High	7
Dunn Creek	Moderate	8
Upper Wapiti Heights	Moderate	9
Rattlesnake Mountain	Moderate	10
Big Creek (Road 6BU)	Moderate	11
South Fork Drainage	Moderate	12
West Jim Creek	Moderate	13
Upper Breteche Creek	Moderate	14
Post Creek	Moderate	15
Jim Creek	Low	16
Breteche Creek	Low	17
Hidden Valley/Sheep Mountain	Low	18

4.2.1 Defensible Space

Defensible space for individual structures should include the following:

- Clean roof and gutters
- Firewood uphill or on a side contour, at least 30 feet away from structure
- No combustibles or firewood under decks
- Screened off openings including attics, eaves, siding, and foundations
- Irrigated greenbelt around structure, at least 30 feet
- 14 feet of vertical clearance for emergency vehicle access along driveways
- Mow grass and weeds to a low height, at least 30 feet from structure
- Remove any branches overhanging the roof or chimney
- Prune all trees 6 to 10 feet from the ground within the defensible space
- Post clearly marked address signs
- Remove all trash, debris, and cuttings from the defensible space
- Remove ground fuels within the defensible space
- See www.firewise.org for more information on creating and maintaining defensible space

4.2.2 Evacuation Routes

The communities in the project area were evaluated for accessibility, egress by evacuating residents, and ingress by emergency responders. Factors such as steep grades, narrow or poor road surfaces, long distances to water fill sites, inadequate turnarounds, locked gates, and heavy fuel loads in proximity to roads all increase the risk to evacuating residents and incoming responders. It is desirable to develop secondary escape routes in case the primary access to a community is cut-off by fire or smoke. Where alternate access routes exist, it is possible to pre-plan evacuations so that evacuating residents do not conflict with incoming resources.

With a few exceptions, the primary access to communities in the project area consists of dead end roads. Due to the topography of the area and the existing road network, no practical additional access routes are recommended in this report. The lack of secondary access in the project area makes keeping the primary access corridors open a critical life safety need for both evacuating residents and responders.

There are short segments of roads in the project area where heat and smoke could threaten access. The following general recommendations for fuels modification should be applied in conjunction with defensible space to increase safety for both residents and responders. The community profile sheets contain specific recommendations for mitigation of access routes.

Thinning along primary access routes into communities should include an area of at least 100 feet on either side of the centerline of the road, where practical. This distance should be modified to account for increased slope, other topographic features that increase fire intensity, and different fuel profiles (**Table 4-2**). This is especially important in communities with steep narrow roads and few turnouts. In these areas, safer access for firefighters will increase the number of structures that can be defended in a wildland fire. Existing and natural barriers to fire should be incorporated into the project dimensions.

TABLE 4-2 RECOMMENDED TREATMENT DISTANCES FOR MID-SLOPE ROADS

Percent Slope	Distance Above Road	Distance Below Road
30	70 feet	145 feet
35	65 feet	153 feet
40	60 feet	160 feet
45	55 feet	168 feet
50	50 feet	175 feet

Mitigating an access route may be a community project. Involve as many adjacent landowners as possible and draw the project area as large as possible. Cooperation between adjacent, contiguous homeowners is imperative to achieve the most effective wildland fire mitigation along access routes. If this is not possible, more intensive thinning may need to occur within the road easement to compensate for gaps in fuels modification on private land. Homeowner participation allows the project more flexibility in selecting trees and shrubs for removal; as a result, visual screening and aesthetics can be incorporated into the project. Enlarging the project dimensions can also allow more options for vegetative selection while still protecting the access corridor.

Fuels modification for access routes should include:

- Create tree crown separation of at least 10 feet with groups of trees and shrubs interspersed as desired
- Crown separation greater than 10 feet may be required to isolate adjacent groups or clumps of trees
- Limb all remaining trees to a height of 8 feet or one-third of the tree height, whichever is less
- Remove ground fuels within the project area
- Post placards clearly marking "fire escape route;" this will provide functional assistance during an evacuation and communicate a constant reminder of wildland fire to the community; mount signage on non-combustible poles.

4.3 GENERAL RECOMMENDATIONS

In addition to mitigation for the individual communities, several general measures can be taken to improve fire safety across the project areas. Addressing, emergency response planning, fire department training and equipment, community education, and insect surveys are discussed below.

4.3.1 Addressing

In some portions of the project area, reflective address markers have been added to existing address markers. These markers have white reflective lettering on a red rectangle. There is no consistency to their placement, including which side of the driveway, how high, or how close to the driveway these markers are placed. Address markers do not exist consistently throughout the project area. Many addresses would be difficult to find, especially at night.

The Greystone Anchor Point team recommends placing visible, reflective address markers consistently throughout the project area. The time saved, especially at night and in difficult conditions, could be significant. This is especially important for volunteer operators who may not have the opportunity to train on access issues in all communities. Address markers should be mounted on a non-combustible pole or similar mounting, at a consistent height and position relative to the driveway. In areas where multiple residences are serviced by a single driveway, all addresses should be mounted together and then marked again as the driveway splits. See the International Fire Code Institute (IFCI) Urban Wildland Interface Code 2000, Section 403.6 for more information on addressing.

4.3.2 Emergency Response Planning

The following recommendations should also be considered in planning for emergency use of access routes.

- In order to reduce conflicts between evacuating citizens and incoming responders, it is desirable to have nearby evacuation centers for citizens and staging areas for fire resources. Evacuation centers should include buildings with facilities large enough to handle the population. Schools and churches are usually ideal for this purpose. Pre-planning and public education are critical for evacuation centers to be effective.
- Fire staging areas should contain large safety zones, a good view in the direction of the fire, easy access and turnarounds for large apparatus, a significant fuel break between the fire and the escape route, topography conducive to radio communications, and access to water. Large irrigated greenbelts may make good safety zones for firefighting forces.

PCFPD #2 is encouraged to preplan the use of potential staging areas with mutual aid responders.

- Perform response drills to determine the timing and effectiveness of fire resource staging areas and access routes.
- Educate citizens on the proper escape routes, and evacuation centers to use in the event of an evacuation.
- Utilize a reverse 911 system or call lists to warn residents when an evacuation may be necessary. Notification should also be carried out by local television and radio stations. Any existing disaster notification systems, such as storm warnings, should be expanded to include wildland fire notifications.
- Emergency management and law enforcement personnel should be included in the development of preplans for citizen evacuation.
- Develop a Pre-Attack/Operational Plan for the project area. A pre-attack plan assists fire agencies in developing strategies and tactics that will assist in incident management.
- Utilize the structure triage methodology provided in **Appendix C** to identify homes not likely to be defensible.

4.3.3 Fire Department Training and Equipment

The following recommendations are made for the PCFPD #2.

- Provide continuing education for all firefighters including:
 - NWCG S-130/190 for all department members.
 - Annual wildland fire refresher and “pack testing” (physical standards test).
 - S-215 Fire Operations in the Urban Interface.
 - S-290 Intermediate Fire Behavior.
 - I-200 and I-300 – Basic and Intermediate incident command system (ICS).
- Equipment:
 - Consider adding a Type 6X engine (four-wheel-drive brush truck) at Station 4.
 - Consider additional staffing for Station 4.
 - Provide minimum wildland personal protective equipment (PPE) for all firefighters (see NFPA Standard 1977 for requirements).
 - Provide gear bags for both wildland and bunker gear to be placed on engines responding to fire calls. This will help ensure that firefighters have both bunker gear and wildland PPE available if the fire situation changes.
 - Provide and maintain a 10-person wildland fire cache at Station 4 in addition to the tools on the apparatus. The contents of the cache should be sufficient to outfit two squads for handline construction and direct fire attack. Recommended equipment would include:
 - Four cutting tools such as pulaskis or super pulaskis.
 - Six scraping tools such as shovels or combis.
 - Four smothering tools such as flappers.
 - Four backpack pumps with spare parts.
 - Two complete sawyer’s kits including chainsaw, gas, oil, sigs, chaps, sawyer’s hard hat, ear protection, flies, file guides, spare chains and a spare parts kit.

4.3.4 Community Education

Community responsibility for self-protection from wildland fire is essential. Educating homeowners is the first step in promoting a shared responsibility. Part of the educational process is defining the hazard and risks both at the community-level and the parcel-level; this has been done as part of this assessment process.

The Greystone Anchor Point team recommends the following important community education steps:

- Send the parcel-level assessments to homeowners to encourage attendance at the second public meeting for this project.
- Review the community-level assessments and mitigation measure at the second public meeting. Clearly communicate next steps and funding available.
- Follow-up with presentations of the community- and parcel-level assessments at neighborhood public meetings.
- Work toward achievement of national FIREWISE status for communities.
- Use public service announcements in the project area to maintain awareness of wildland fire danger and encourage defensible space. This could include billboards, a public service message on the utility bill, flyers in local stores, and public service announcements in the local newspaper.
- Disseminate wildland fire safety information in visitor packets that are available at the Chamber of Commerce, hotels, and campgrounds.

The following general recommendations are intended for residents and business owners in the project area.

1. Be aware of the current fire danger in the area.
2. Clean roof and gutters at least two times per year, especially in autumn, after strong winds, and in the spring before fire season.
3. Stack firewood uphill or on a side contour, at least 30 feet away from structures.
4. Don't store combustibles or firewood under decks.
5. Maintain and clean chimneys.
6. Screen off any openings in attics, eaves, siding and foundations to reduce the likelihood of embers and firebrands entering them from a wildland fire.
7. When possible, maintain an irrigated greenbelt around the home.
8. Connect, and have available, a minimum of 50 feet of garden hose.
9. Post reflective lot and/or house numbers so that they are clearly visible from the main road. There should also be reflective numbers on the structure itself.
10. Trees along driveways should be limbed and thinned as necessary to maintain a minimum of 14 feet of vertical clearance for emergency vehicle access.
11. Every structure should have a maintained, defensible space.
 - Mow grass and weeds to a low height.
 - Remove any branches overhanging the roof or chimney.
 - Remove all trash, debris, and cuttings from the defensible space.

- Use Firewise plants in landscaping near homes. The use of pines, firs, junipers and other flammable conifers to landscape within the defensible space is strongly discouraged.

4.3.5 Insect Surveys

In addition to the recommendations above, the Greystone Anchor Point team recommends annual insect and disease surveys take place in any area exhibiting signs or symptoms of attacks. Insect surveys should be conducted in between an insect's flight periods to identify newly attacked trees. All newly attacked trees should be removed and treated prior to the beginning of the insect's next flight period. For example, mountain pine beetle (*Dendroctonus ponderosae*) should be surveyed for between the months of October and June. Mountain pine beetle-infested trees should be removed and treated prior to July 1 of the following year.

5.0 ROLES AND RESPONSIBILITIES

To be successful, community mitigation must be a community-based, collaborative effort. The current coordination between the BLM and the PCFPD #2 has already made great strides by facilitating the assessment conducted in this report.

The BLM and the PCFPD #2 will have the greatest responsibility for implementing the recommended mitigation projects. The Shoshone National Forest would also be a valuable participant in addressing cross-boundary projects. The Park County Commissioners are currently planning to prepare a community fire plan, and should also be encouraged to collaborate with this effort to facilitate planning efforts.

Nearly all of the recommendations from this report affect private land or access roads to private land. As such, their success will be largely dependent on the participation of landowners. BLM and PCFPD #2 are committed to encouraging the participation of as many interested landowners as possible; these outreach efforts began with the first public meeting for this project.

BLM and PCFPD #2 will identify funding for the implementation for mitigation projects. They will also prioritize and manage the distribution of these funds. All community-wide mitigation projects should be coordinated by a single point of contact, most likely a PCFPD #2 representative. Homeowner cooperation and permission for projects on private land will be more likely if there is a local fire department representative overseeing the details. This would also allow cross boundary projects to be more effectively implemented.

There are also recommendations for individual structures that are the responsibility of the homeowner. However, they will need a point of contact, most likely a member of the PCFPD #2, to help them implement these recommendations. The best defensible space will be created with some oversight and expert advice from fire department personnel. One-on-one dialog will continue to build the relationship with the community. It will also allow the agencies to keep track of the progress and update this plan to reflect the latest modifications.

6.0 FUNDING GUIDELINES

A number of funding sources are available to communities to implement mitigation recommendations. Once Community Fire Protection Plans are completed, federal funds become available for those projects. County and State funding also may be available. It is important to understand what funds are available, how to access them, and the restrictions on their use.

The Greystone Anchor Point team has found that identifying "cross-boundary" projects is particularly helpful in winning grant funds. For example, a project where the Shoshone National Forest, interested landowners, BLM, and the PCFPD #2 can work together.

There are many sources of funding for fire projects. Some available funds and where to find more information is provided below.

- Agency: Homeland Security, Office for Domestic Preparedness
Purpose: to assist local, State, regional, or national organizations in addressing fire prevention and safety; the emphasis for these grants is the prevention of fire related injuries to children.
More information: <http://www.firegrantsupport.com/>
- Agency: Federal Emergency Management Agency (FEMA)
Purpose: to improve fire fighting operations, purchase firefighting vehicles, equipment, personal protective equipment, fund fire prevention programs, and establish wellness and fitness programs.
More information: <http://usfa.fema.gov/dhtml/inside-usfa/grants.cfm>
- Agency: FEMA
Purpose: Assistance to Firefighters Grant Program
More information: www.usfa.fema.gov/dhtml/inside-usfa/apply.cfm and www.nvfc.org/federal/funding.html
- Agency: National Volunteer Fire Council
Purpose: Support volunteer fire departments
More information: <http://www.nvfc.org/federal/funding.html>
- Agency: Community Facilities Grant Program
Purpose: help rural communities; funding is provided for fire stations
More information: www.rurdev.usda.gov/rhs/
- Agency: Firehouse.com
Purpose: Emergency services grants
More information: www.firehouse.com/funding/grants.html
- Agency: Cooperative Forestry Assistance
Purpose: assist in the advancement of forest resources management; the control of insects and diseases affecting trees and forests; the improvement and maintenance of fish and wildlife habitat; and the planning and conduct of urban and community forestry programs
More information: www.usfa.fema.gov/dhtml/inside-usfa/cfda10664.html

- Agency: Forest Service, Economic Action Programs
Purpose: Economic Action Programs that work with local communities to identify, develop, and expand economic opportunities related to traditionally underutilized wood products and to expand the utilization of wood removed through hazardous fuel reduction treatments.
More information: www.fireplan.gov/community_assist.cfm